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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference P1503	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI00/00067	International filing date (day/month/year) 02/02/2000	Priority date (day/month/year) 15/02/1999
International Patent Classification (IPC) or national classification and IPC D21C7/08		
Applicant SULZER PUMPEN AG et al.		



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 13/09/2000	Date of completion of this report 18.05.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Maremonti, M Telephone No. +49 89 2399 8440 

INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

International application No. PCT/FI00/00067

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-3,5-11	as published	
4,4a	with telefax of	08/02/2001

Claims, No.:

1-16	with telefax of	08/02/2001
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Drawings, sheets:

1/2,2/2	as published
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2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

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- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-16
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

- 2. Citations and explanations**
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

R Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1.1 The present application relates to a method of treating pulp, whereby pulp is discharged from an apparatus, i.e. a batch digester, and it is fed into a blow or storage tank, and whereby the pulp may be fed both to an upper and to a lower part of said tank.

Document WO-A-9739181 (D1), which is considered to represent the most relevant state of the art, discloses such a method.

- 1.2 The subject-matter defined in claim 1 differs from the method of D1 in that the pulp is fed to the upper or to the lower part of the mentioned tank, depending on the consistency of the pulp discharged from the mentioned apparatus. In particular, the pulp at a consistency below a certain value is fed to the upper part, whereas the pulp at a consistency above said certain value is fed to the lower part of the tank. In this way, it is ensured that the pulp consistency remains uniform at various locations in the tank and that the pulp flows evenly at a relatively uniform consistency downwards to the mixing zone and then to a following process stage (see p. 4, l. 16-24).
- 2.1 In document D1 of the same applicant, the pulp is fed to various locations along the height of the tank, depending on the surface level of the pulp within the tank (cf. p. 1, l. 9-17, Figure 1 and claim 1). According to the description of the present application, this kind of tank filling, though helping in filling the blow tank better than before, still presents problems related to the uniformity of the pulp consistency, especially when dilute pulp is to be discharged (see p. 3, l. 29-p.4, l. 4). This causes problems at the later process stages, where pulp with a non-uniform consistency is received. No indication is given in D1 that the pulp could be fed either to the top or to the bottom of the tank, depending on the pulp consistency.
- 2.2 Document FI-B-94442 (D2) discloses a method in which the pulp is fed to a tank through several pipes connected only to the bottom of the tank (cf. Figures 1 and

- 2). No indication of other possible filling configurations is given.
- 3.1 The solution proposed in the present application is considered to be, therefore, not obvious over the available state of the art.
As a consequence, the subject-matter of claim 1 fulfils the requirements of Articles 33(2) and (3) PCT.
- 3.2 Independent claim 9 defines an apparatus for treating pulp, comprising structural features, which correspond to the method features mentioned in claim 1. Hence, the same reasoning as reported in paragraphs 1.1 to 2.2 above applies and the subject-matter of claim 9 is regarded as to fulfil the requirements of Articles 33(2) and (3) PCT, as well.
4. Dependent claims 2-8 and 10-16 concern particular embodiments of the subject-matter of independent claims 1 and 9, respectively, and therefore, they fulfil the requirements of Articles 33(2) and (3) PCT.
5. The subject-matter of all claims is regarded as to be industrially applicable (Articles 33(4) PCT).

Re Item VII

Certain defects in the international application

1. The end of page 3 does not match with the beginning of page 4. Apparently, a line is missing.
2. The first line on page 5 is superfluous, since it is the same as the last line on page 4a.

Re Item VIII

Certain observations on the international application

1. The term "essentially", mentioned in claims 9 and 13 is vague and relative and it is not clear to a skilled person what should be intended. Therefore, it should have been deleted (Article 6 PCT).

where dilute pulp is being discharged to the tank through the apparatus. This channels directly from the inlet opening of the feeding apparatus towards the mixing zone, resulting in principle in the same kind of situation as the solution according to Fig. 2a.

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FI-B-94442 discloses yet another method and an apparatus for filling a pulp tower. The apparatus includes a number of feed pipes attached to the bottom of the pulp tower so that pulp is introduced into the pulp tower via said feed pipes. The purpose is to prevent the channeling of the pulp by ensuring that the pulp pillar in the tower raises uniformly towards the outlet at the top of the tower.

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Naturally, when treating pulp, problems of the same kind appear not only in connection with blow tanks but elsewhere as well, e.g. in connection with pulp storage tanks at various stages of the pulp treatment process.

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Said problems are suggested to be solved by an arrangement where part of the pulp is discharged into the tank via its upper part and part of the pulp through the lower part of the tank. Further, the pulp discharged via the upper part of the tank is in the upper part of the tank distributed evenly onto the whole cross section of the tank, whereby even the pulp discharged from the upper part of the tank is not capable of penetrating deep into the pulp existing in the tank, but stays on the surface of the pulp, thus ensuring that the consistency of the pulp remains uniform at various locations in the storage tank and that the pulp flows evenly at a relatively uniform consistency downwards to the mixing zone.

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The operating model described above solves a third problem, too, viz. a disadvantage related to the energy consumption of the filling of blow and storage tanks. It has namely been noticed that especially when the tanks are filled through an inlet opening arranged at the upper end of the tank only, remarkable amount of pumping energy is lost due to great fluctuations in the pulp level in the tank. Pumping the pulp to the altitude of the upper end of the tank and letting it drop from there to the

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4a

bottom of the tank is mere waste of energy. By utilizing the solution according to the invention described above, part of the tank, according to a preferred example half of the tank, i.e. the bottom part of it, is filled substantially through a feed inlet at the bottom of the tank and only the upper part of the tank through a feed inlet
5 located essentially at the upper end of the tank. When filling the tank through the bottom thereof, at the bottom of the tank there is preferably provided a filling de

AMENDED SHEET

FMPFANGS7FIT 8. FEB. 8:59

AUSDRUCKS7FIT 8. FEB. 9:04

CLAIMS

1. A method of treating pulp, by which method pulp is discharged from a process apparatus (10) and fed into a blow or storage tank (20), characterized in that the pulp may
5 be fed into said tank (20) both to the upper and the lower part of it depending on the consistency of the pulp being fed from said process apparatus (10) in such a manner that pulp at a consistency below a certain consistency is discharged into said tank (20) through the upper part of the tank (20) and pulp at a consistency above said consistency is discharged into said tank (20) through the lower part of the tank (20)..
- 10 2. A method according to claim 1, characterized in that the pulp feed is controlled by means of a consistency detector arranged in a discharge tube (32, 36) of said process apparatus.
- 15 3. A method according to claim 2, characterized in that said consistency detector is a blow pump (34).
4. A method according to claim 1, characterized in that said process apparatus (10) is a batch digester.
- 20 5. A method according to claim 1 or 4, characterized in that the pulp feed is controlled according to a pre-determined consistency profile.
6. A method according to claim 5, characterized in that said consistency profile has
25 been determined as a function of time, whereby said pulp feed is controlled based on time passed from the beginning of the digester discharge.
7. A method according to claim 1, characterized in that the pulp fed into the tank (20) through the upper part of the tank (20) is distributed onto the whole cross section of the
30 tank (20).

8. A method according to claim 1, **characterized** in that the pulp fed into the tank (20) through the upper part of the tank (20) is distributed on top of the pulp already existing in the tank (20).

5 9. Apparatus for treating pulp comprising at least one process apparatus (10) and one pump (34), a blow or storage tank (20) and a pipeline connecting these, **characterized** in that said pump (34) is connected to said blow or storage tank (20) via two feed pipes (40, 42), one (40) of said pipes leading to the top of the tank (20) and the other one (42) essentially to the bottom of the tank (20).

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10. Apparatus according to claim 9, **characterized** in that at the pressure side of said blow pump (34) there are means (38) arranged for distributing the pulp flow to said feed pipes (40, 42).

15 11. Apparatus according to claim 10, **characterized** in that said distribution means (38) is a valve by means of which the flow coming from the pump (34) is directed to one of said feed pipes (40, 42).

20 12. Apparatus according to claim 10, **characterized** in that said distribution means comprises valves positioned in the feed pipes (40, 42).

25 13. Apparatus according to claim 9, **characterized** in that in connection with the feed pipe (40) leading to the tank (20) through the upper part of the tank (20) there is arranged a device (44) distributing the pulp essentially uniformly into the tank (20).

14. Apparatus according to claim 9, **characterized** in that said apparatus is formed of a plurality of batch digesters (10) and one or more blow pumps and a blow tank (20) into which the digesters (10) are discharged.

30 15. Apparatus according to claim 9, **characterized** in that said process apparatus is a press, a washer or a dilution device.

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16. Apparatus according to claim 9, characterized in that the apparatus further comprises a consistency detector for controlling the operation of the feed pipes (40, 42).

AMENDED SHEET

EMPFANGS7FIT 8. FFR. 8:59

AUSDRUCKS7FIT 8 FFR 9:04